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TARDEC Update for TTCP

APRIL 2009

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- The purpose of this brief is to update The Technology Co-operation Program team on several fronts

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Senior Research Scientist	
Gerhart, Dr. Grant	4-8634
Executive Assistant	
Teceno, Mary Lou	4-8626

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Gonda, Terry	925-2601
Lean Six Sigma Cell**	
Strategic Communications**	

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Executive Officer	
Ryans, Almena	4-6125
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Rosario, Ruth	4-6144

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VACANT	
Quick Reaction Cell**	
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Operations Cell**	
Smith, Vicki – TL	

* 120-Day Detail Positions

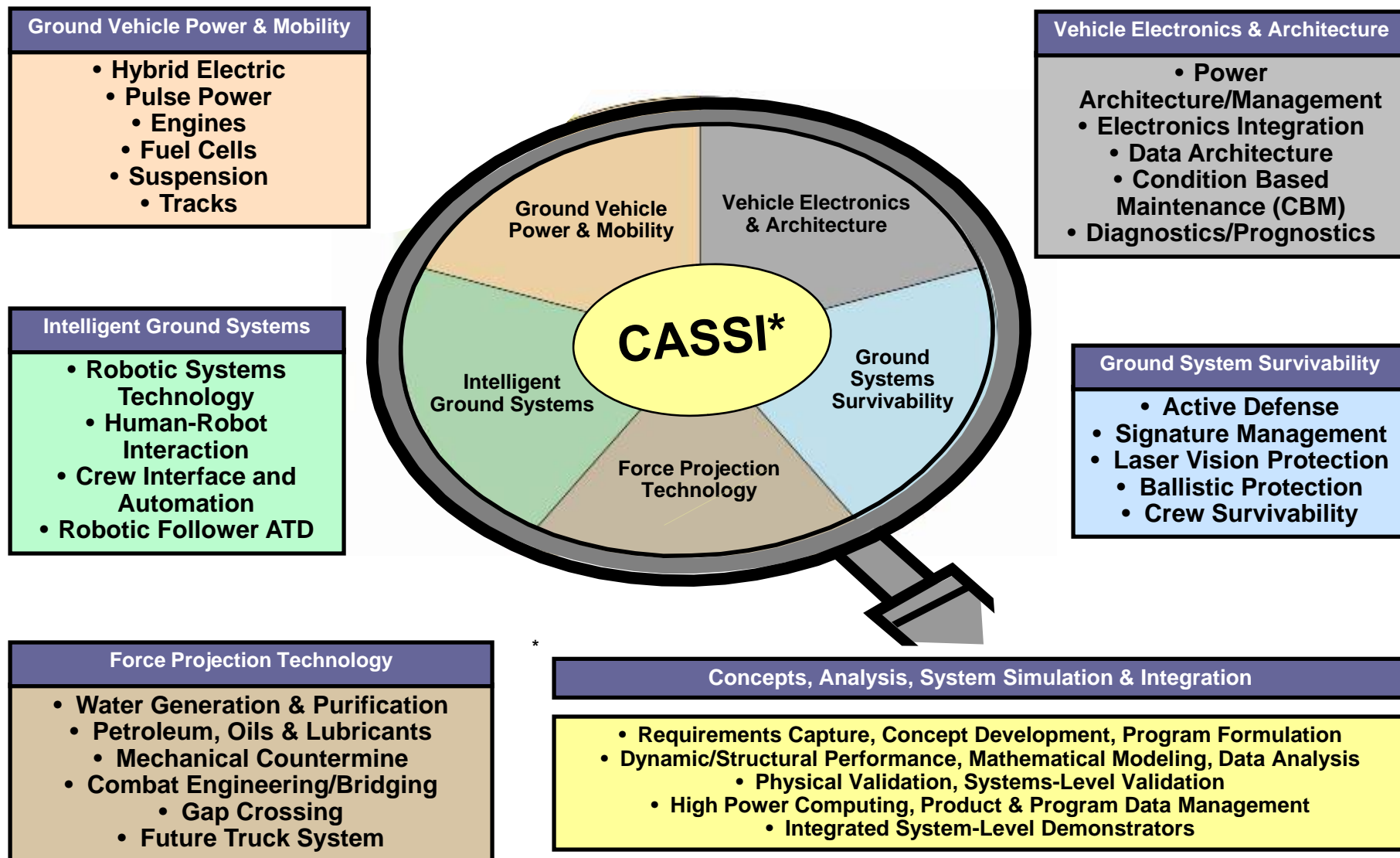
** Shown on another chart

*** Acting

Exec Dir of Development	
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Skalny, Paul	4-6387
Director of Center Support	
DeVuono, Frank***	4-8589
Dir of Pgm Analy and Eval	
Misuraca, Tony***	4-7173
Business Manager	
Misuraca, Tony	4-7173
Plans & Programs Manager	
Sanders, Derhun*	4-7126

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Joint Center for Robotics		Sys Demonstrators AD	
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Tech PM for Unmanned Ground Vehicles		HW & Man-in-loop Sim AD	
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		HPC & Data Mgmt AD	
		Ciarelli, Ken*	4-5086

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Product Lifecycle Data Mgmt		Engineering Business Office	
VACANT		Direct/Matrix Support to PMs	
Power & Materials		Next Gen Software	
Tomkiw, Marta	4-7455	Slominski, Mark	4-4260



Mission:

- Provide Rapid Assessment and Integration Services to both Technology and System/Platform Development Programs
 - Throughout the Lifecycle (Requirements – Technology Insertion – Demo – Production – Sustainment – Product Improvement Projects)
 - Consider War fighter, System, and System-of-Systems Contexts

Objectives:

- Provide (Systems/System of Systems) Perspective to Combat Developer, PM and Tech Developer on Requirements, Tradeoffs & Integration
- Provide SWAP, Performance, Operational, Cost, & Sustainment Impacts
- Provide and Share Configuration Managed Data on Technologies, Systems, M&S and related programs/processes
- Explore Multiple Options and Trades Rapidly

Methods:

- Develop Vehicle Concepts & Perform Concept Analysis and Trade Studies
- Perform System Assessments using Physics-based, Statistical-based, HW/Man-in-the-Loop, and Distributed Simulation Tools
- Develop Integrated System Level Demonstrators

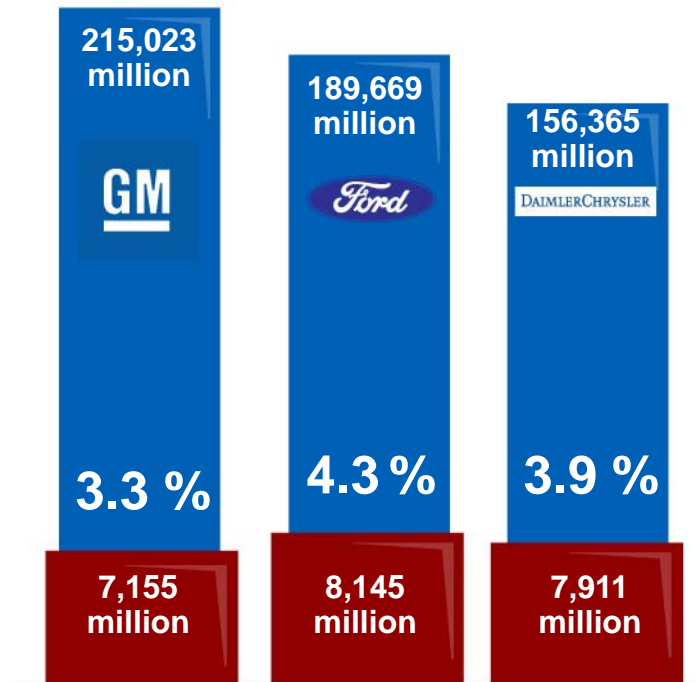
TACOM LCMC (2007)*



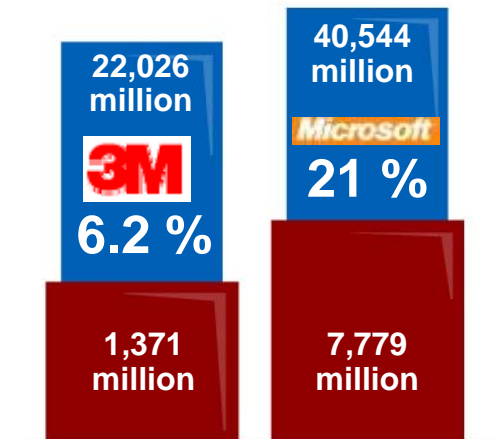
*Based on 2007 TACOM APBI

US AUTOMOTIVE INDUSTRY

(2007 Dollars based on 2004 figures at a rate of inflation of 3.25%)**



Other US INDUSTRY (2007 Dollars based on 2004 figures at a rate of inflation of 3.25%)**



**Based on 2004 Annual Reports

Predecessor Vehicle: Armor Protected MXT
Produced under contract to the US Army's
TARDEC: National Automotive Center



- Work has started on a fleet of over 200 new 'go anywhere' vehicles which will greatly improve the protection of British troops in Afghanistan.
- Navistar Defense is building and supporting the new Husky vehicle which has been designed for a range of missions including transporting food, water and ammunition, and acting as a command vehicle at headquarters.
- Equipped with a machine gun, the new protected support vehicle is designed to provide commanders with a highly mobile and flexible load-carrying vehicle for the troops on operations.
- The vehicle is based on the Navistar MXT-MV platform, which was developed in partnership with the US Army's TARDEC-NAC.

**The Husky will provide a robust
and highly mobile protected
support vehicle for operations**



PROGRAM MANAGER
FCS
BRIGADE COMBAT TEAM
One Team-The Army/Defense/Industry



Future Combat Systems Overview

The Future Combat Systems (FCS) is the cornerstone of Army Modernization. FCS is the Army's promise to provide Soldiers the best equipment and technology available as soon as practical. FCS is not just a technology development program-it is the development of new Brigade Combat Teams-these new brigades, with more infantry, better equipment, unmatched situational awareness and communications allowing complete domination in asymmetric ground warfare while allowing the Army to build a force that can sustain itself in remote areas. It can also be adaptable to civil support, such as disaster relief. FCS will provide the Army and the joint force with unprecedented capability to see the enemy, engage the enemy, and defeat the enemy on today's and tomorrow's battlefield.



Joint Light Tactical Vehicles Overview

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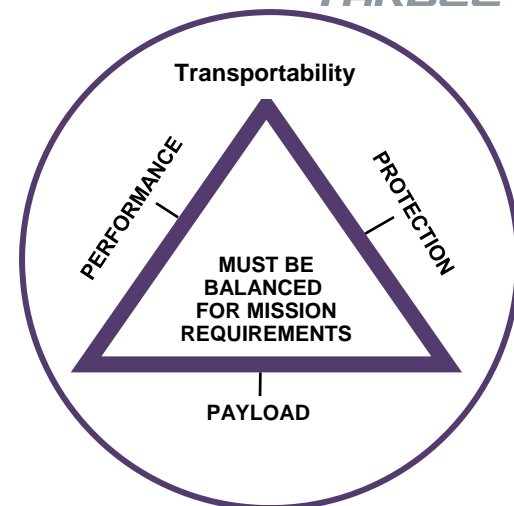
Jointly develop, produce, field and sustain safe, reliable, suitable and effective family of Joint Light Tactical Vehicles

VISION:

JLTV – Providing our Joint Warfighter with the very best in light tactical vehicle payload, protection and performance

Capability gaps within existing fleet are the result of an imbalance in protection, payload, and performance within a transportable vehicle

- Current fleet mix:
 - Protection: fixed protection in light vehicles
 - Require inherent and supplemental armor, scalable to mission
 - Payload: supplemental armor reduces useable payload
 - Require a design that supports armor, warriors, mission equip, C4, cargo
 - Performance: supplemental armor degrades all elements
 - Require a design that supports mobility, reliability & maintainability at gross vehicle weight & transport at essential combat configuration
 - Transportability: current platforms lack armor design flexibility to allow full range of transportability
 - Require a design which enables Rotary and Fixed Wing Air, Sea, Overland transport



The JLTV vehicles *YOU* will build will address this imbalance & meet DoD goals for costs & long-term sustainability



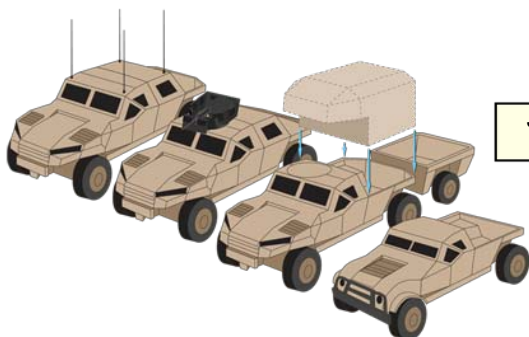
2005



2005



2007



JLTV Tech Demo: CAD models of JLTV FoV

Sources: JLTV CDD, CONOPS, & OMS/MP

JLTV to provide scalable C4I and adaptable levels of protected mobility to Fire Teams and Combat Support teams.

Adaptable:

- Varying levels of protection in response to mission threat
- Expeditionary vehicle family
- Over full range of operations / conditions

Network-Ready / Interoperable

- Space, weight, power claims for C4I systems

Resilient:

- Designed to enter harms way & return forces safely
- Adapts light fleet to the IED / Counter Insurgency paradigm
- Retains Major Combat Operations capability

Increases maneuver capacity:

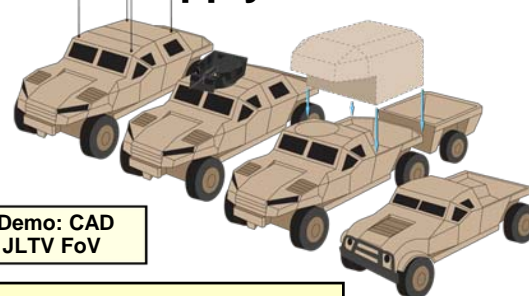
- Provides protected mobility on the modern battlefield

Protected Mobility:

- Exceeds current TWV payload & tactical mobility
- Increase protection (especially EFP & IED) through scalable armor
- Returns payload currently traded for armor

Increased commonality:

- JLTV to be designed for commonality beyond major components, to include repair parts, tools, training, system design, maintenance procedures and sources of supply



JLTV Tech Demo: CAD models of JLTV FoV

Sources: JLTV CDD, CONOPS, & OMS/MP

TECHNOLOGY DRIVEN. WARFIGHTER FOCUSED.

PAYLOAD CATEGORY A

Payload: 3,500
Performance: Exceed HMMWV
Transport: 1x EAT* CH 47/53
2x IAT** C130

Sub-Configurations

General Purpose Mobility
(4 Seat) - **Army/USMC**

TARDEC
Concept Example



* EAT: External Air Transport
** IAT: Internal Air Transport

Program focus during
Technology Development Phase
is on these key configurations
build key vehicles, 1 A, 2 B, 1 C

PAYLOAD CATEGORY B

Payload: **4000/ 4500 lbs**
Performance: Exceed HMMWV
Transport: 1x EAT* CH 47/53
1x IAT** C130

Sub-Configurations

Infantry Carrier, Fire Team (6
Seat)-**Army/USMC**

Reconnaissance (6 Seat) - **Army**

C2OTM (4 Seat) - **Army/USMC**

Heavy Guns Carrier (MP, Patrol,
Escort) (4 Seat+ Gunner)-
Army/USMC

ITAS (TOW) Carrier (4 Seat)
Army/USMC

Utility (2 Seat) - **USMC**

Ambulance (3 Seat+2 Litters)
Army/USMC

ONR & TARDEC
Concept Examples



PAYLOAD CATEGORY C

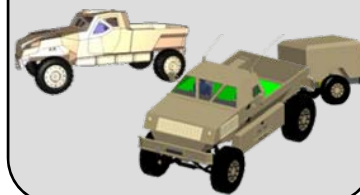
Payload: 5,100 lbs
Performance: Exceed HMMWV
Transport: 1x EAT* CH 47/53
1x IAT** C130

Sub-Configurations

Shelter Carrier / Utility /Prime Mover
(2 Seat) - **Army/USMC**

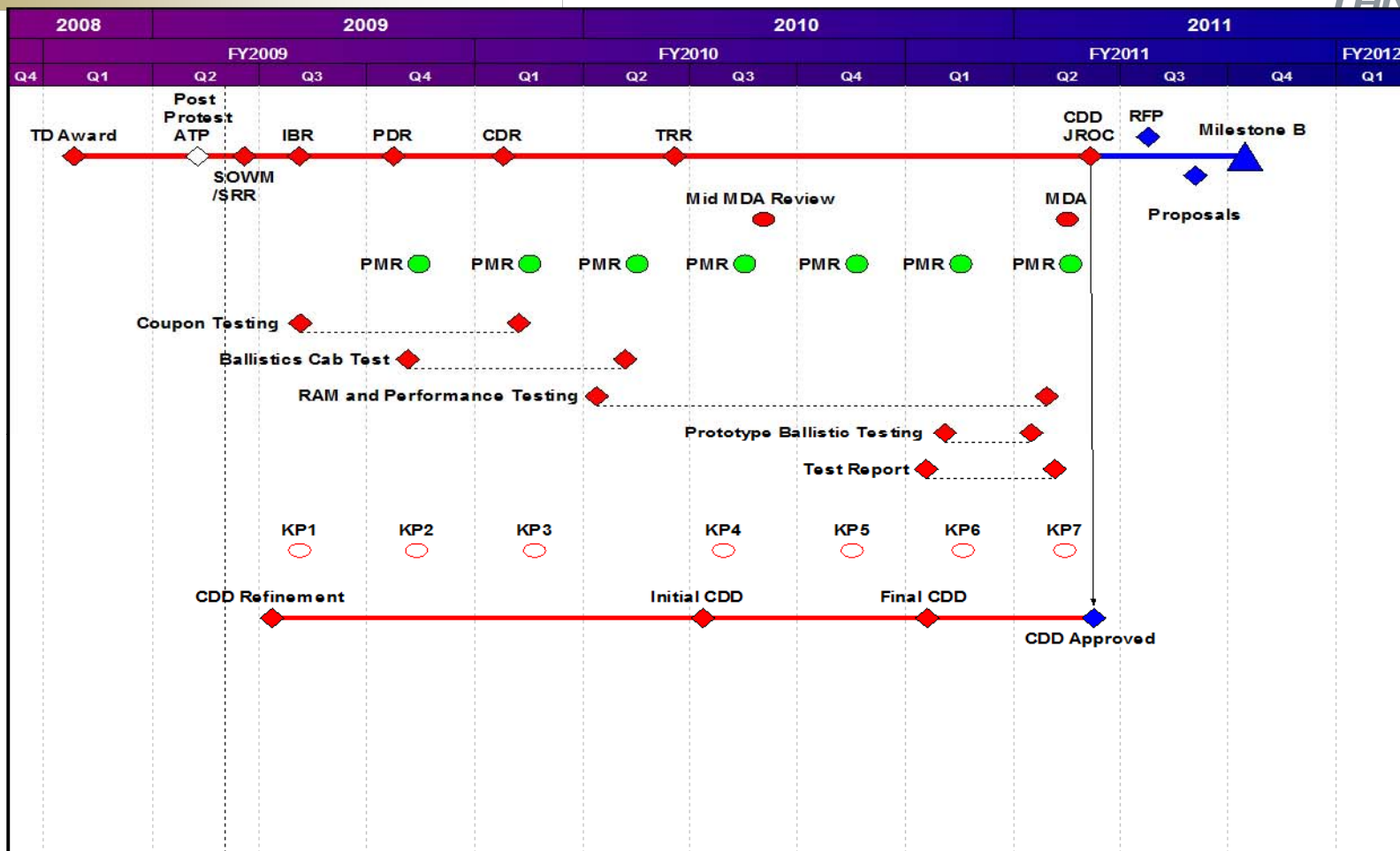
Ambulance (3 seat + 4 Litter) -
Army/USMC

ONR & TARDEC
Concept Examples



Trailers for each payload category to
have equivalent payload and mobility
to support prime movers.





- Continue to monitor funding situation and schedule impact
- KP Reviews are designed to inform the CDD and PD requirements by looking at requirements achievability across all 3 KTRs
 - Organized thru Requirements IPT and led by Combat Developer

TD Program Schedule v1.0
Dated: 3 March 09

- Approval of the appropriate capabilities development document (CDD or CPD), supported by analysis from TD work
- Demonstration of an ability to achieve TRL 6 (minimum) in an integrated system with a focus on:
 - Protection
 - Transportability
 - Reliability
 - Producibility
- An assessment of commonality across the JLTV FoV
- An assessment of the technical risks relevant to entering initial production will to lay a foundation for the Manufacturing Assessment done during EMD.



Survivable Vehicles for the Warfighters



Light & Medium Armored Vehicles

2-6 Feb 09



COL Kevin Peterson
Principal Deputy Program Manager
Joint MRAP Vehicle Program



Manufacturer

Navistar Defense



MaxxPro



MaxxPro MEAP Ready



MaxxPro Plus



MaxxPro Dash

BAE



CAIMAN CAT I (BAE-TVS)



CAIMAN PLUS



BAE CAT II RG 33L



BAE CAT II LRIP 10

Force Protection



FP COUGAR CAT I (FPII CAT I)



FP COUGAR CAT II (FPII CAT II)

General Dynamics



GDLS RG31 (MK5) • CAT I



GDLS RG31 (MK5) EM • CAT I

- Nine separate Foreign Military Sales Cases open with Four different Coalition Partners
- Eight different Variants procured to date
- Two models custom designed to meet Country unique requirements
- 10 Additional Coalition Force / Country inquiries with 2 potential procurements efforts pending
- MATV will be added to procurable MRAP line this FY.

- Approved Army ONS for 134 vehicles to recover MRAP
- Addendum to MRAP I Performance Specification being developed to address recovery capabilities.
- Acquisition Strategy similar to MRAP Armored Utility Vehicle may be pursued.
- Survivability requirements similar to that of MRAP I
- Draft Characteristics:
 - Flat Tow & Lift Tow MRAPs
 - 30 Ton Crane Capacity
 - 40 Ton Main Recovery Winch Capacity



- Technology Insertion
 - Rear-View Camera
 - Long Range Advanced Scout Surveillance Sensor (LRAS3)
 - CROWS II
 - Boomerang
 - VanGuard
 - TOW Integrated Target Acquisition Sensor (ITAS)
 - Additional Exterior Lighting
 - Mounted Battle Command on the Move (MBCOTM)
 - DVE Forward Assisted Detection System (FADS)



CROWS II



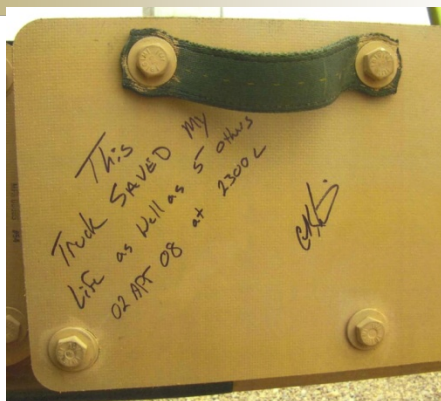
LRAS3



Boomerang

- Onboard Electric Power Enhancement
 - Leveraging Stryker and FCS Common Modular Power System development
 - Pursuing APU and Dual Alternators as Risk Mitigation
- Common C4 Architecture
 - Supports future growth and possible FCS technologies
- Survivability Enhancements
 - Improved Gunner Restraint System
 - Overhead Wire Mitigation System
 - Automated Fire Extinguishing System
 - Crew Compartment, Engine Compartment, Tires
 - Improved Seats/Seat Belts

- Request for Information / Market Survey Issued 21 Aug 2008.
- Responses received September 2008.
- Requirements Based On JUONS.
 - MRAP Protection Levels.
 - Agility, Maneuverability, Mobility of HMMWV
- Industry Input Will Be Evaluated To Determine Achievability of Defined Need
- Assuming Evaluation Determines One or More Approaches Submitted are Viable to Achieve Stated Requirements Funding Will be Requested.



- BACK-UP SLIDES

Program Governance

- OSD / ARMY / NAVY
- Program Certification & Milestone Decisions

Material Development

- PEO CS & CSS / PM JCSS / PM JLTV
- Program Management
- Milestone Documentation Development

Requirements Development

- CASCOM / MCCDC
- CDD Development & Staffing for Approval

Industry

- BAE Systems – Ground Systems
- Lockheed Martin Owego
- General Tactical Vehicles





Science & Technology

- TARDEC / ONR
- Technology Development
- Trade Studies to Support Requirements Development

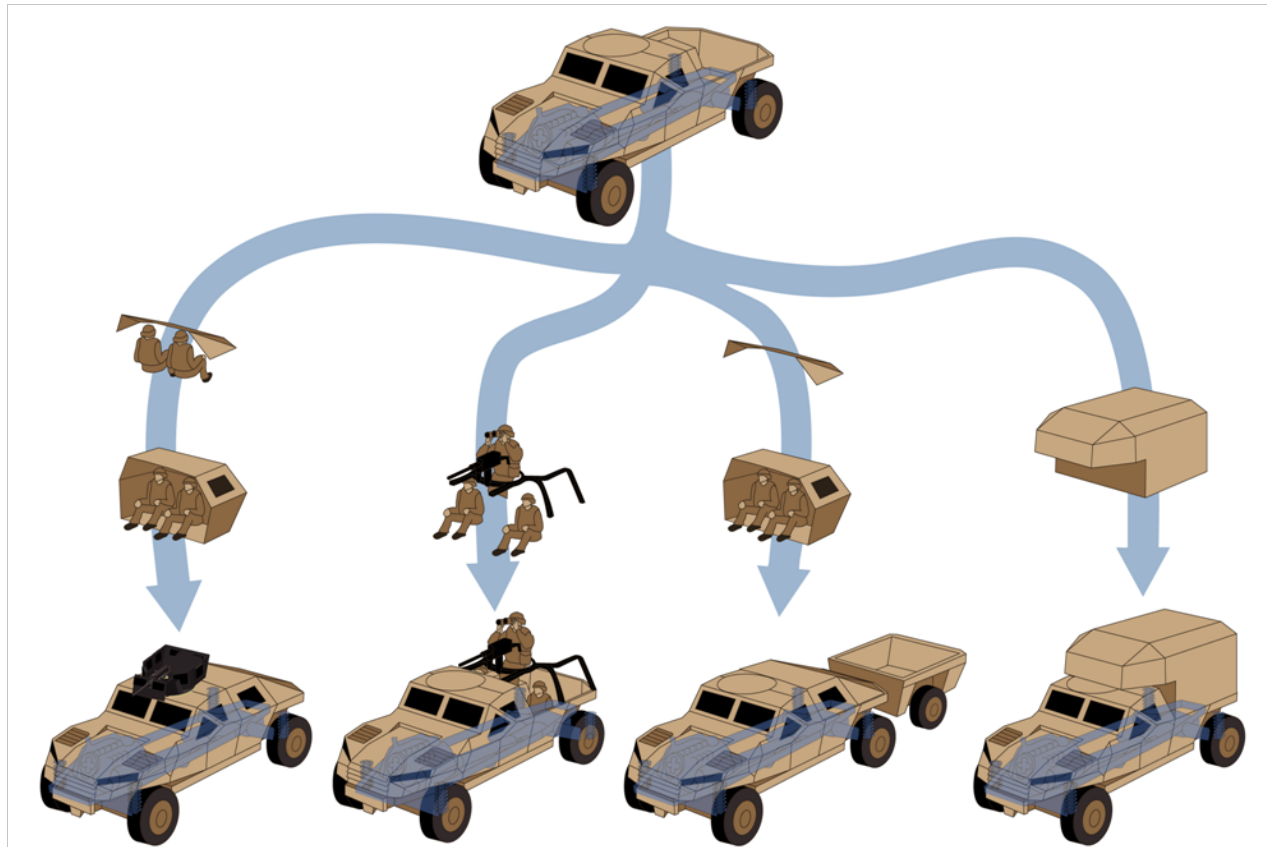


International Participants

- Countries: Australia, Israel & Canada
 - PA: Australia
 - Pending PA / Technical Discussions: Israel
 - Data Exchange Agreements: Canada & UK



JLTV Cat B, IC.



JLTV to be designed for commonality beyond major components, to include repair parts, tools, training, system design, maintenance procedures and sources of supply



DoD



DoN USMC



DCMA



DLA



LOGCOM



DoA



DoAF



SAF AC



ATEC



Aberdeen
Test Center



SOCOM



PEO CSS



DoN



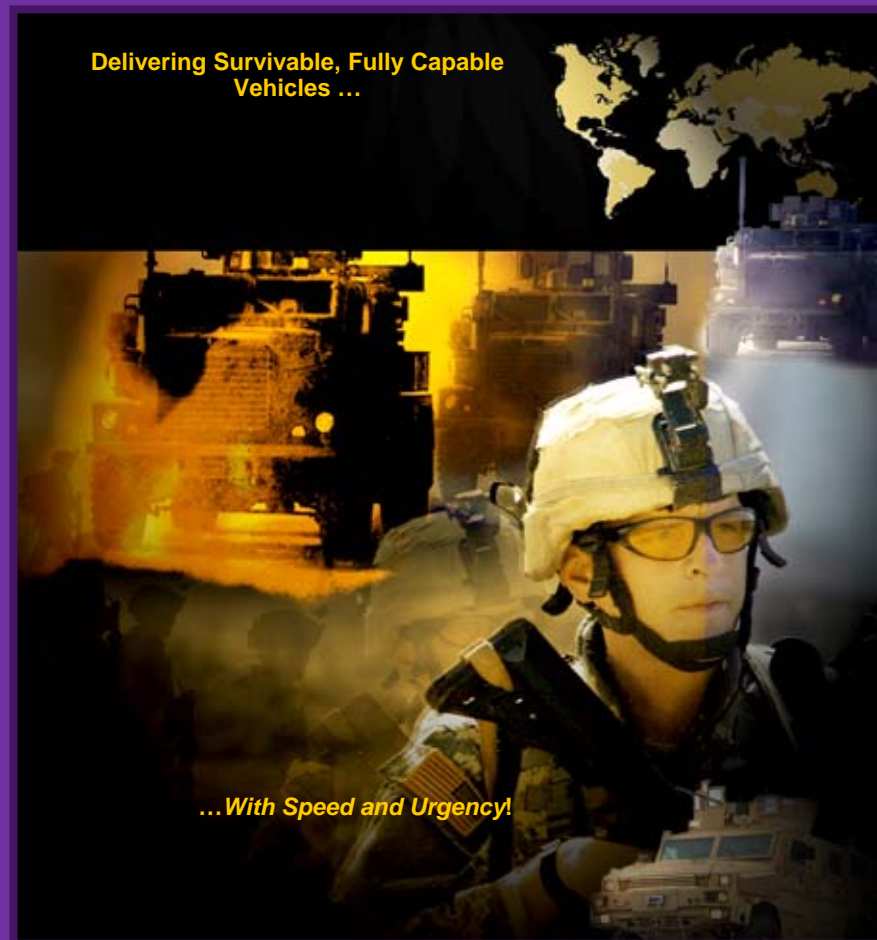
ASN RDA

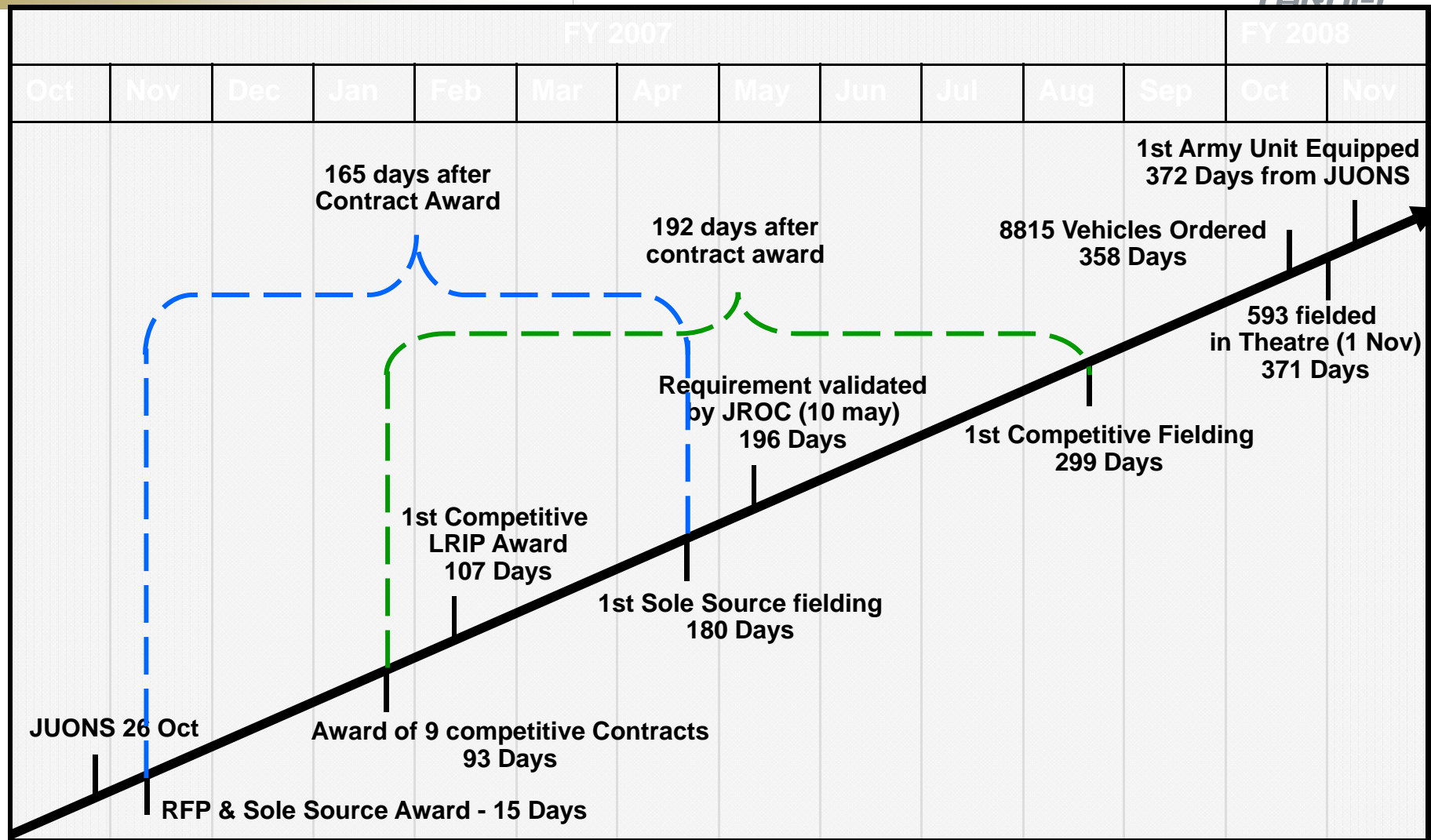


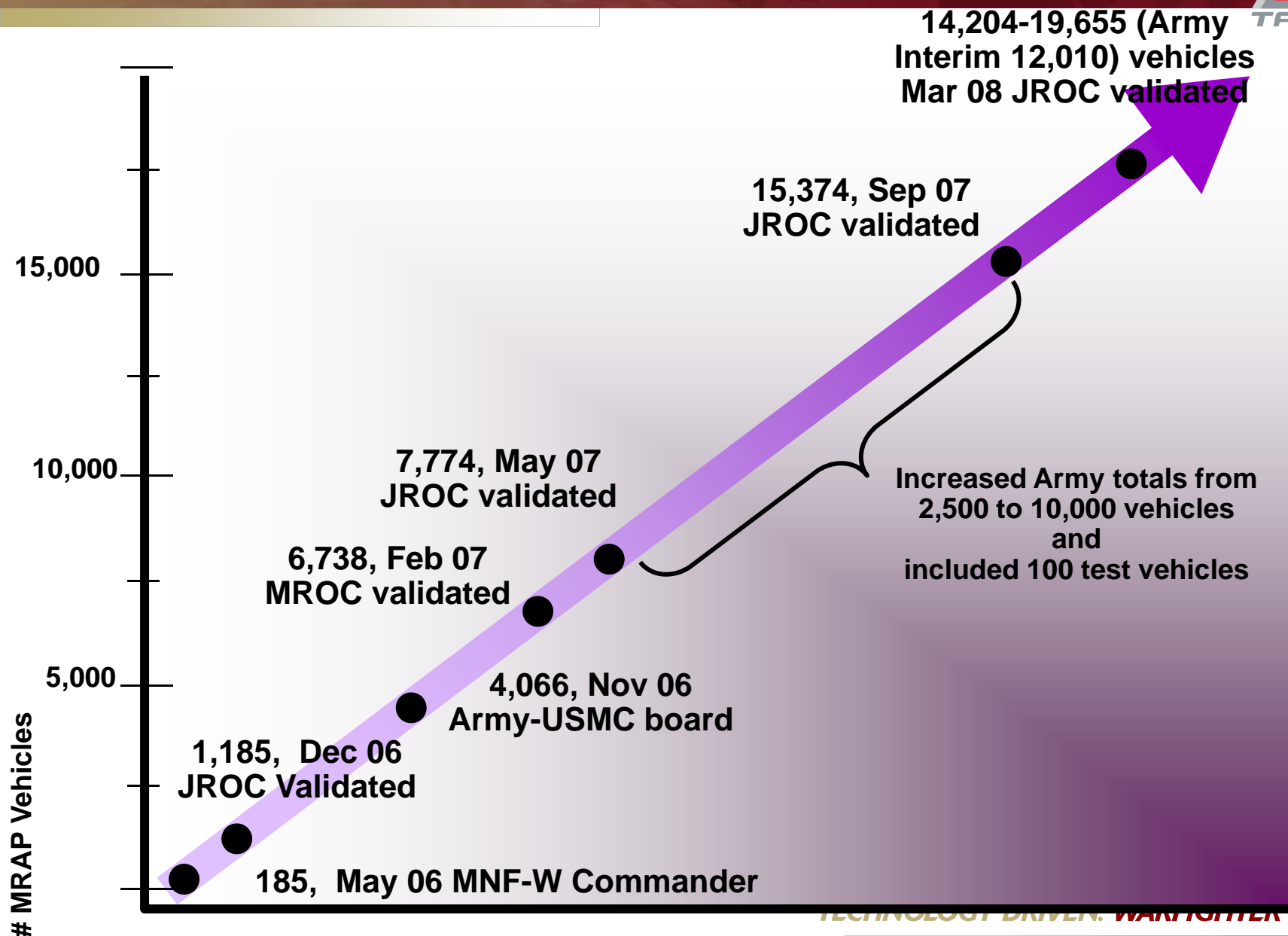
NAVFLAC

- Change in enemy tactics generated an urgent Warfighter need for:
 - Mine Resistant Ambush Protected Vehicle
 - Large quantities
 - Required ASAP

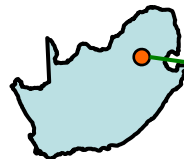
- MRAP Program is the response to this urgent need
 - Unprecedented effort
 - Unprecedented speed
 - Unprecedented Gov / Industry Teamwork







Benoni, South Africa



GDLS-C



CAT I RG31E

- Capsule fabrication
 - Demmer, Lansing, MI
 - Benoni, South Africa
- Chassis
 - Spartan, Charlotte, MI
 - Benoni, South Africa
- Capsule fabrication, welding and final assembly
 - York, PA
 - Benoni, South Africa

BAE



CAT I SOCOM



CAT II HAGA

CAT II RG 33L

- Capsule fabrication
 - Demmer, Lansing, MI
 - BAE, York, PA
 - BAE, Aiken, SC
- Chassis
 - Spartan, Charlotte, MI
- Welding and final assembly
 - BAE, York, PA

BAE-TVS

(Formerly Armor Holdings)



CAT I CAIMAN

- Capsule fabrication
 - Armor Holdings GVSD, Fairfield, OH
 - Armor Holdings Sealy AD, Phoenix, AZ
- Chassis
 - Armor Holdings TVSD, Sealy, TX
- Welding and final assembly
 - Armor Holdings TVSD, Sealy, TX

FP II



CAT I COUGAR



CAT II COUGAR

CAT III BUFFALO

- Capsule fabrication
 - Ultra Machines, Kings Mtn, NC
 - MCLB, Albany, GA
 - FP II, Charleston, SC
- Chassis
 - Armor Holdings, Sealy, TX
- Welding and final assembly
 - Spartan, Charlotte, MI
 - FP II, Charleston, SC

IMG



CAT I MAXXPRO

- Capsule fabrication
 - IMG, West Point, MS
- Chassis
 - IMG, Gap, TX
- Welding and final assembly
 - IMG, West Point, MS
- Armor
 - Plasan Sasa, Israel

Plasan Sasa, Israel



- ❖ 62 Major Tier 2 vendors for 15 critical sub-assemblies, for example:
 - Armor (8)
 - Diesel Engines (3)
 - Suspension components (9)
 - ❖ Defense Contract Management Agency (DCMA)
 - ❖ Testing and Evaluation Commands





MRAP Vehicle Requirements			
Service	JROC Service Requirements	Procured Against Requirements	Remaining Vehicles to Order
USMC	2,225	2,209	16
Army	12,000	12,000	0
Navy	544	544	0
Air Force	558	558	0
SOCOM	378	378	0
Ballistic Testing	133	133	0
Total	15,838	15,822	16

• Above based on JROCM 151-08 dtd 28 July 2008)

• JROCM 226-08 dtd 20 November 2008 increases Total to 16,238. These addt'l 400 vehicles will be allocated among the Services and SOCOM to support the efficient fielding and coordination of the Theater Commander's priorities.

- SPAWAR System Center

- Now integrating an average of 50 vehicles per day.

**Lean Six Sigma
Consortium of
Government and
Industry**



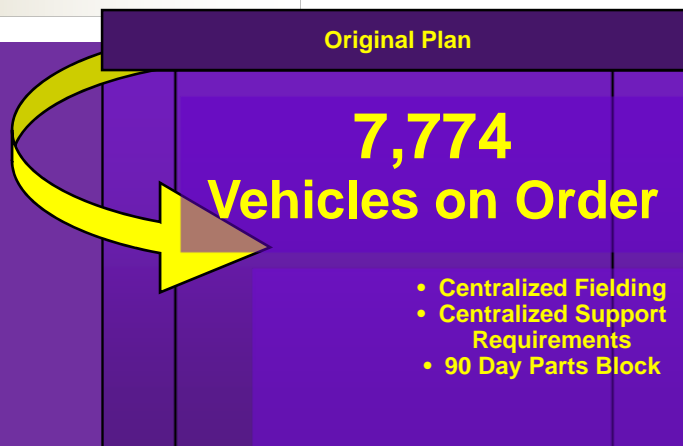


- Services and Components

- USMC
- USA
- USAF
- USN
- SOCOM

- Service Logistic Commands

- Warfighters



+

Warfighter Feedback
and Lessons Learned

=



- Decentralized Simultaneous Fieldings
- Decentralized Support Requirements
- Hybrid/Organic Support Concept

- Speed to field
- Multiple variants
- Urgent Fielding
- COTS
- Variations along the way

VS

- ❖ Complete Testing
- ❖ One variant
- ❖ Fully supported
- ❖ Designed for Services
- ❖ Configuration controlled

